



San Jose to Merced High-Speed Train Project EIR/EIS

South of Diridon Station to Tamien Station

Alternatives Analysis Community Workshop

March 2, 2010



Meeting Purpose and Agenda

Purpose

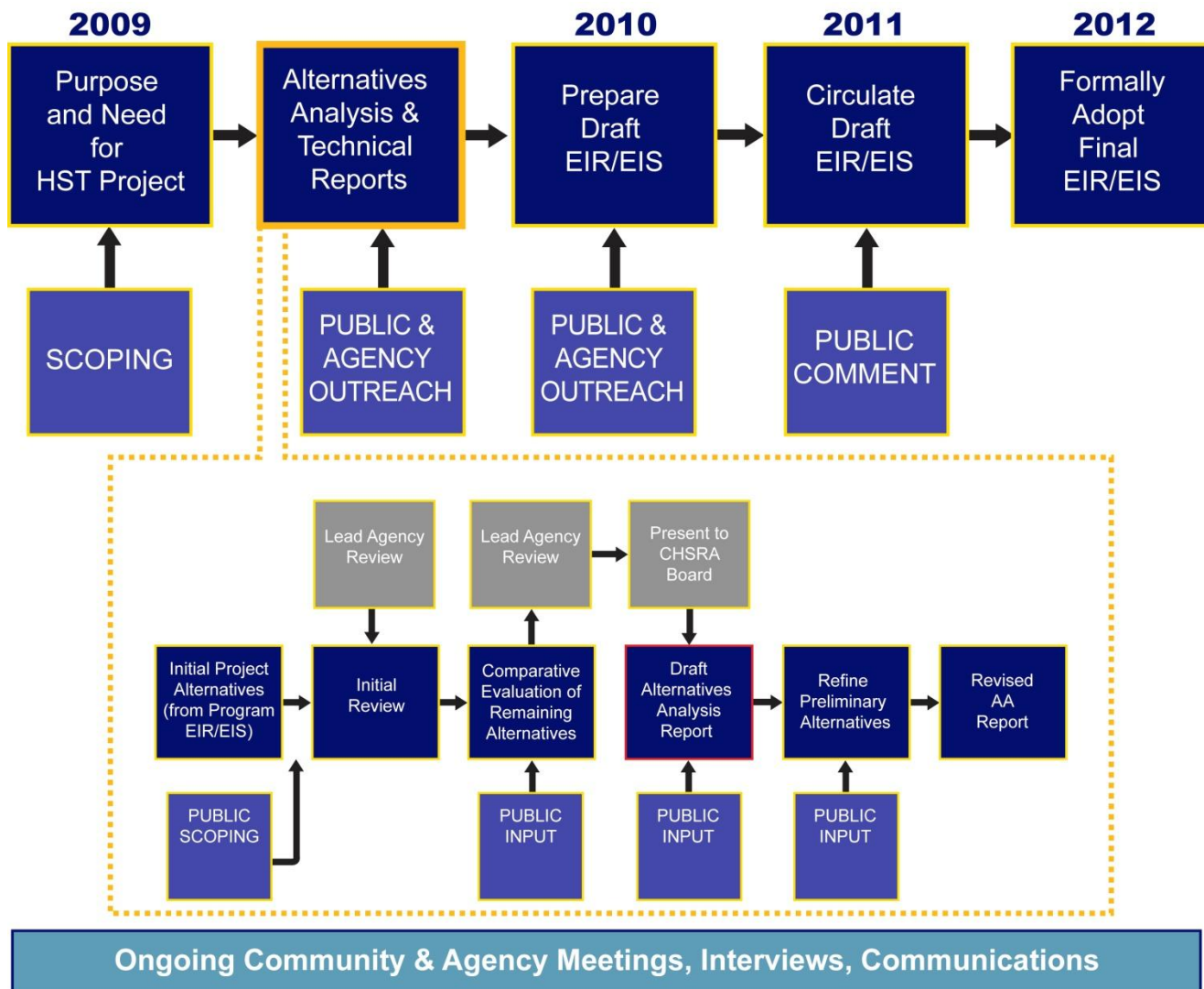
- Present additional detail on alternative alignment options in the south of Diridon Station area
- Solicit input on community needs and values
- Share thoughts on the alternatives being evaluated with a panel of local leaders

Agenda

- Interactive Open House: 6:30 - 7:15 p.m.
- Presentation: 7:15 – 7:40 p.m.
- Panel Discussion and Q&A: 7:40 – 9:00 p.m.
- Resume Open House: 9:00 – 9:30 p.m.



Environmental Review Schedule & Alternatives Analysis Process





San Jose Station Approach Subsection

① San Jose HST Station:

Downtown Tunnel (Additional Study Needed)

- Construction complexity
 - Poor soils
 - Groundwater issues
 - Mined station
 - 110' underground
- Costs 6 times base case

SR 87 / I-280

- Suggested by City of San Jose
- Move HST line away from neighborhood
- Constructability issues over freeways

Downtown Aerial

- Numerous property takes
- Impacts City's planned development
- Visual impacts

Refined Program Alignment

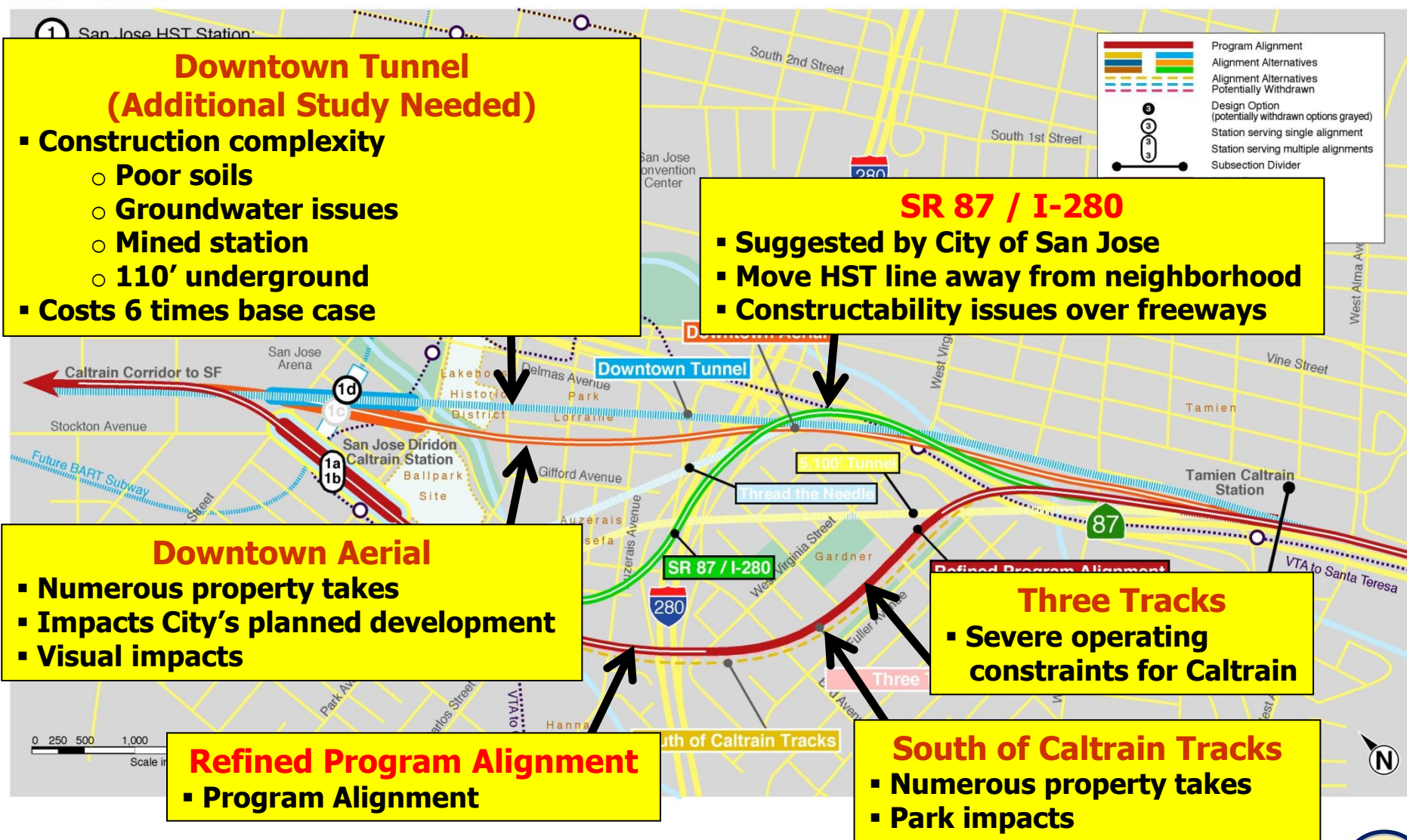
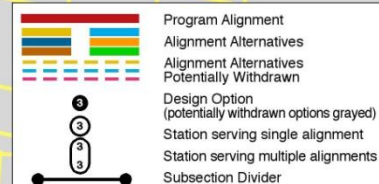
- Program Alignment

Three Tracks

- Severe operating constraints for Caltrain

South of Caltrain Tracks

- Numerous property takes
- Park impacts





AA Evaluation/Risk Factors

- **Constructability**
 - Disruption to surface/subsurface structures, railroad operations, right of way
- **Geotechnical Constraints**
 - Soil type, presence of groundwater, potential for settlement
- **Disruption to Communities**
 - Residential/business impacts, local traffic/detours, city division
- **Environmental Impacts**
 - Noise, vibration, dust, visual/scenic impacts
- **Environmental Resource Impacts**
 - Biological, cultural, archaeological resource impacts
- **Cost and Schedule**
 - Operation/capital costs, schedule implications
- **Other**
 - Emergency response, safety, staging/access for construction



San Jose Diridon Station - Before





Aerial Station Photo Simulation - After





Downtown San Jose - Existing





Refined Program Alignment - Simulation





I-280/SR 87 Alignment - Simulation



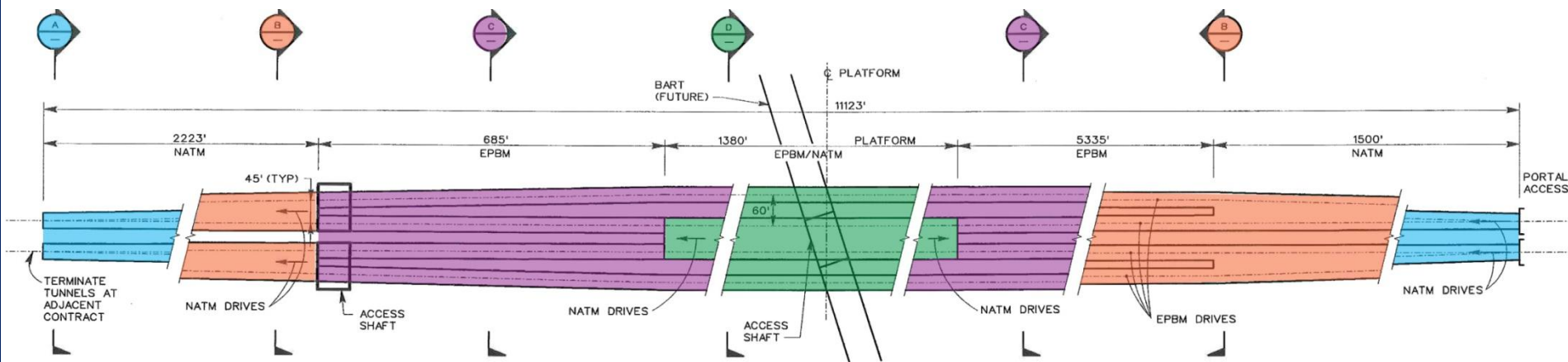


Tunnel Overview

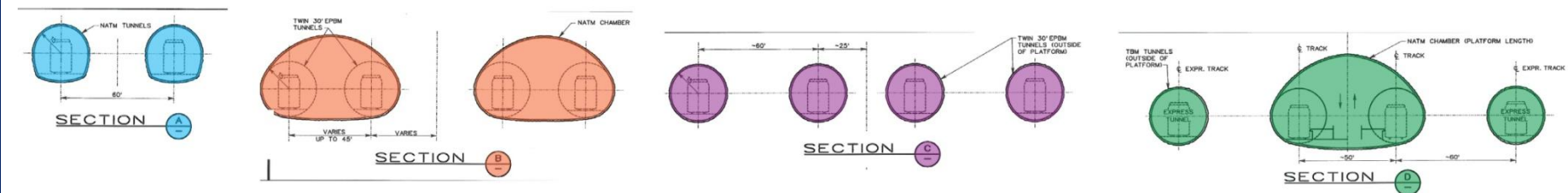
- Project-specific requirements
- Conditions on and under the ground



Tunnel Alternative Project Specific Requirements



HST Center Platform - Plan



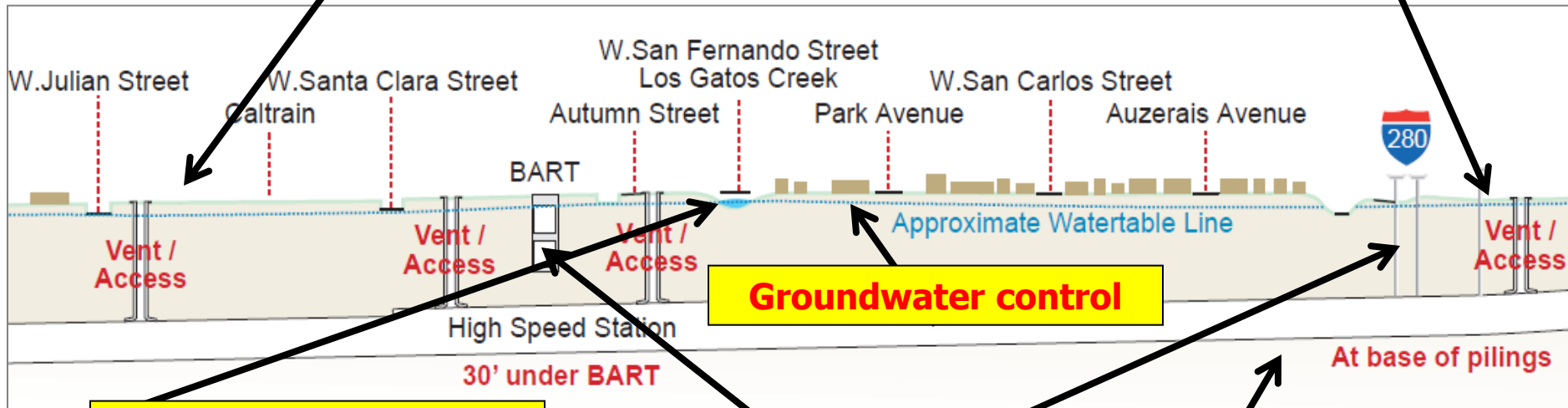
HST Tracks - Cross-section



Tunnel Alternative Feasibility and Constructability Factors

**Vibration from construction
& operations**

Ground stability



Groundwater control

**Impacts on Guadalupe
River, Los Gatos Creek**

**Impacts on I-280/SR-87,
proposed BART station**

Seismicity and liquefaction

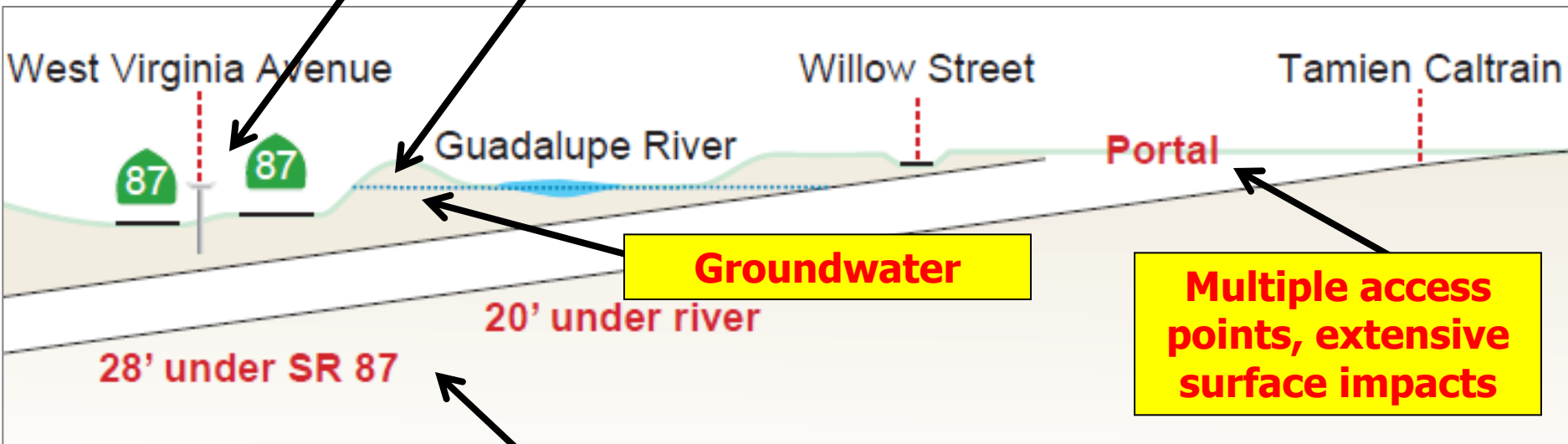
Conceptual profile of tunnel/station



Tunnel Alternative Conditions on and under the Ground

**Existing buildings
& structure
foundations**

**Dense urban
location**



Groundwater

**Multiple access
points, extensive
surface impacts**

Soil conditions

Conceptual profile of tunnel/portal



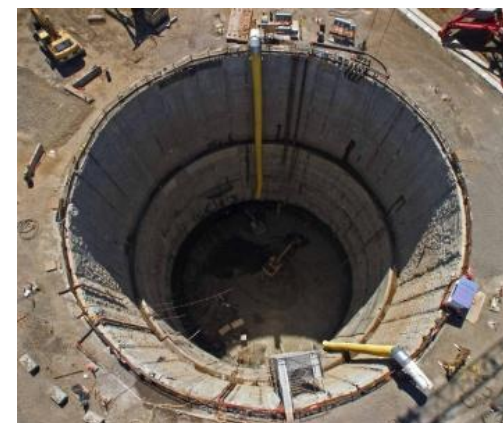
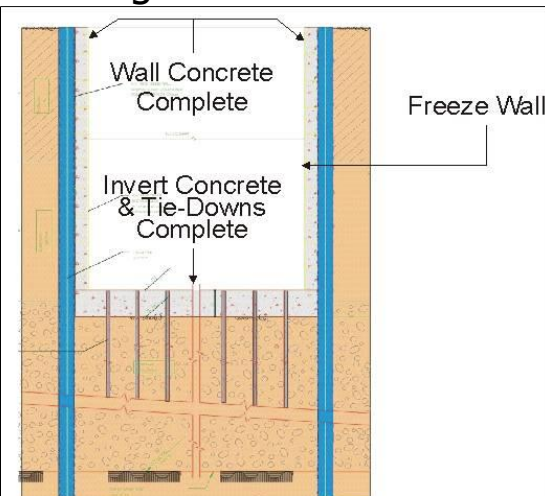
Tunnel and Station Construction Methods



Site Investigation and Preparations

- Ground must be stabilized, work area must be water tight
- Methods include freezing or installing a “slurry wall”
 - Typical “dewatering” risky
- All work areas must be stabilized, significant surface disruption

Ground freezing



Slurry wall installation



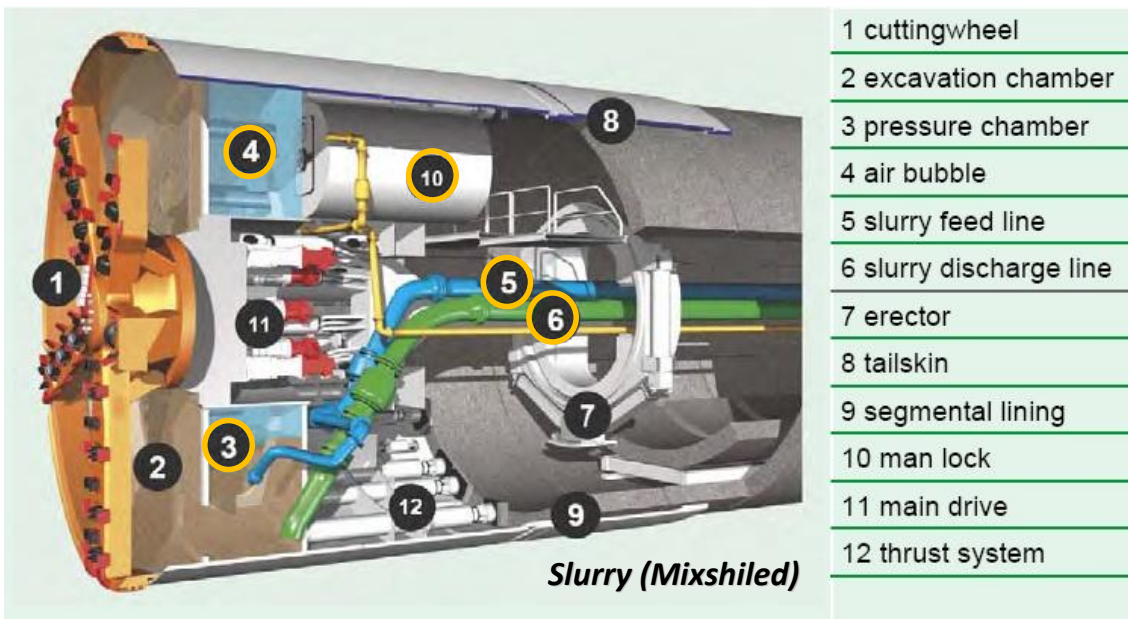
Tunnel Construction Tunnel Boring Machine

Advantages

- Tunnel boring machines capable of tunnel construction
- Simultaneously advances and supports construction

Disadvantages

- Reduces, but does not eliminate risk of settlement, cave-in
- Does not work for non-circular openings (track switches, cross-overs)
- Massive trailing gear, can't use for station
- Added cost and delivery time for specialized equipment





Tunnel Construction

Tunnel Boring Machine



TBM trailing gear (500+ feet)



Back end of a TBM (diameter ~30')



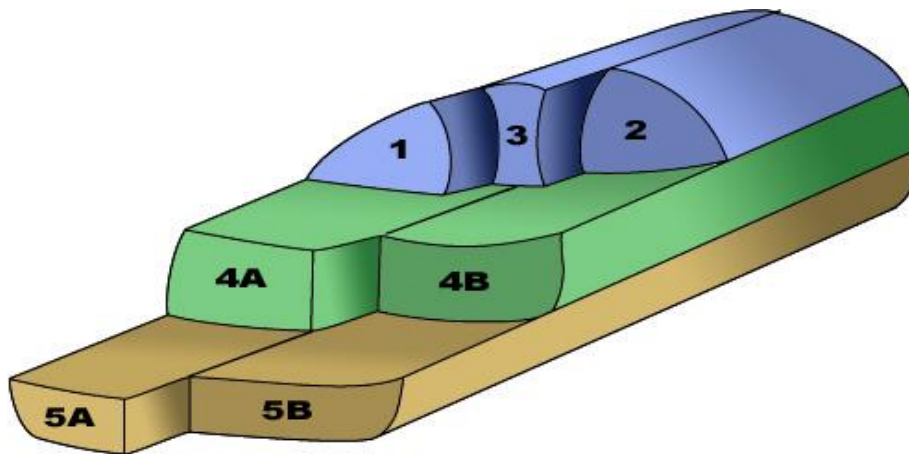
Sequential Excavation Method/New Austrian Tunnel (SEM/NATM) Method Construction for Station

Advantages

- Simultaneously advances and supports construction
- Provides more real-time monitoring of soil conditions
- Construct non-circular openings, station

Disadvantages

- Reduces, but does not eliminate risk of settlement, cave-in
- Groundwater problematic (no dewatering)
- Requires ground stabilization/ground improvements
- Costly
- Lengthy construction schedule
- Added delivery time for specialized equipment



SEM/NATM Sequential Excavation of a Tunnel



Tunnel Alternatives





Downtown Tunnel Alternative (Tamien)



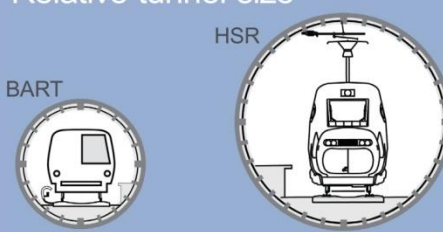



Downtown Tunnel Alternative (Station)





Comparison to BART

	BART	HSR
Construction methods – Station	Cut and cover- requiring acquisition and access to entire surface area above tunnel	Conventional segmental mining (SEM) requires ground improvements from the surface
Construction methods - Tunnel	Earth Pressure Balance Tunnel Boring Machine (EPBM) or Slurry Tunnel Boring Machine	SEM for turnouts, cross-overs and cross passages. EPBM for tunnels
Size & depth of station	Approx. 50 ft. wide by 900 ft. long, and 60 ft. deep	Platforms 1380 feet long Approximately 140 feet deep 70 ft. wide by 40 ft. high
Approximate cost	Multiple stations and tunnels nearly \$3.1 billion	Stations and tunnels at Diridon nearly \$3 billion
Relative size comparisons	<p>Relative tunnel size</p> 	<p>Relative station size</p> 



Next Steps & How to Comment

- **Release Draft AA Report for review:** **Spring 2010**
- **Public meetings**
- **Revised AA Report:** **Summer 2010**

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Questions & Comments?